

Coronavirus:Defination,symptoms,types,Treatment,



- January 31, 2020

What are Coronaviruses?

Coronaviruses (CoV) are a large family of viruses that cause illness ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (**MERS-CoV**) and Severe Acute Respiratory Syndrome (**SARS-CoV**). **A novel coronavirus (nCoV)** is a new strain that has not been previously identified in humans.

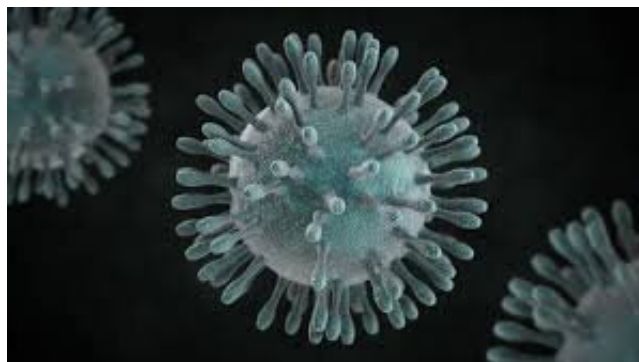
Coronaviruses are zoonotic, meaning they are transmitted between animals and people. Detailed investigations found that SARS-CoV was transmitted from civet cats to humans and MERS-CoV from dromedary camels to humans. Several known coronaviruses are circulating in animals that have not yet infected humans.

Types of coronavirus es:

There are seven strains of **human**

coronaviruses:

1. Human coronavirus 229E (HCoV-229E)
2. Human coronavirus OC43 (HCoV-OC43)
3. SARS-CoV



4. Human coronavirus NL63 (HCoV-NL63, New Haven coronavirus)
5. Human coronavirus HKU1
6. Middle East respiratory syndrome coronavirus (MERS-CoV), previously known as novel coronavirus 2012 and HCoV-EMC.
7. Novel coronavirus (2019-nCoV), also known as Wuhan pneumonia or Wuhan coronavirus. ('Novel' in this case means newly discovered, or newly originated and is a placeholder name.)

Human coronavirus 229E (HCoV-229E):

Coronaviruses are believed to cause a significant percentage of all common colds in human adults and children. **Coronaviruses** cause colds with major symptoms, e.g. fever, throat swollen adenoids, in humans primarily in the winter and early spring seasons.

Coronaviruses can cause pneumonia, either direct viral pneumonia or secondary bacterial pneumonia and they can also cause bronchitis, either direct viral bronchitis or secondary bacterial bronchitis. The much-publicized human coronavirus discovered in 2003, **SARS-CoV** which causes **severe acute respiratory syndrome (SARS)**, has unique pathogenesis because it causes both upper and lower respiratory tract infections.

Novel coronavirus (2019-nCoV):

2019 **Novel Coronavirus** (2019-nCoV) is a **virus** (more specifically, a coronavirus) identified as the cause of an outbreak of respiratory illness first detected in Wuhan, China. Early on, many of the patients in the outbreak in Wuhan, **China** reportedly had some link to a large seafood and animal market, suggesting animal-to-person spread. However, a growing number of patients reportedly have not had exposure to animal markets, indicating person-to-person spread is occurring. At this time, it's unclear how easily or sustainably this **virus** is spreading between people. The latest situation summary updates are

available on CDC's web page 2019 Novel Coronavirus, Wuhan, China.

Human coronavirus OC43 (HCoV-OC43):

Human coronavirus OC43 is a subspecies of enveloped, positive-stranded RNA virus in the species Betacoronavirus 1 (genus Betacoronavirus, subfamily Coronavirinae, family Coronaviridae, order Nidovirales).

Human coronavirus HKU1:

Human coronavirus HKU1 (HCoV-HKU1) is a positive-sense, single-stranded RNA virus with the HE gene, which distinguishes it as a group 2, or **Betacoronavirus**. It was discovered in January 2005 in two patients in Hong Kong. **HCoV-HKU1** was first identified in January 2005, in a 71-year-old man who was hospitalized with acute respiratory distress and radiographically confirmed bilateral pneumonia. The man had recently returned to Hong Kong from Shenzhen, China.

SARS-CoV(Severe acute respiratory syndrome-related coronavirus):

Severe acute respiratory syndrome (SARS) was a contagious disease caused by the SARS-CoV coronavirus. It typically led to a life-threatening form of pneumonia.

The virus started off in the Guangdong Province in southern China in November 2002, eventually reaching Hong Kong. From there, it rapidly spread around the world, infecting people in 37 countries.

SARS-CoV is unique. It can infect both the upper and lower respiratory tract and can also cause gastroenteritis.

The symptoms of **SARS** develop over the course of a week and start with a fever. Early on in the condition, people develop flu-like symptoms, such as:

- dry coughing

- chills
- diarrhea
- breathlessness
- aches

Pneumonia, a severe lung infection, may develop afterward. At its most advanced stage, **SARS** causes failure of the lungs, heart, or liver.

During the epidemic, there were 8,098 confirmed cases of **SARS** with 774 fatalities. This is equal to a mortality rate of 9.6 percent. Complications were more likely in older adults, and half of all infected people over the age of 65 years who became ill did not survive. It was eventually brought under control in July 2003.

MERS-CoV(Middle East respiratory syndrome-related coronavirus):

Middle East respiratory syndrome-related coronavirus (MERS-CoV), or EMC/2012 (HCoV-EMC/2012), is a novel positive-sense, single-stranded RNA virus of the genus Betacoronavirus.

As of July 2015, MERS-CoV cases have been reported in over 21 countries, including Saudi Arabia, Jordan, Qatar, Egypt, the United Arab Emirates, Kuwait, Turkey, Oman, Algeria, Bangladesh, Indonesia (none were confirmed), Austria, the United Kingdom, South Korea, the United States, Mainland China, Thailand, and the Philippines. MERS-CoV is one of several viruses identified by WHO as a likely cause of a future epidemic. They list it for urgent research and development.

Replication:

Following the entry of this **virus** into the cell, the virus particle is uncoated and the RNA genome is deposited into the cytoplasm. The **coronavirus** RNA genome has a 5' methylated cap and a 3' polyadenylated tail. This allows the RNA to attach to ribosomes for

translation. **Coronaviruses** also have a protein known as a replicase encoded in its genome which allows the RNA viral genome to be transcribed into new RNA copies using the host cell's machinery. The replicase is the first protein to be made; once the gene encoding the replicase is translated, the translation is stopped by a stop codon. This is known as a nested transcript. When the mRNA transcript only encodes one gene, it is monocistronic. A **coronavirus** non-structural protein provides extra fidelity to replication because it confers a proofreading function, which is lacking in RNA-dependent RNA polymerase enzymes alone. The **RNA genome** is replicated and a long polyprotein is formed, where all of the proteins are attached. Coronaviruses have a non-structural protein – a protease – which is able to separate the proteins in the chain. This is a form of genetic economy for the virus, allowing it to encode the greatest number of genes in a small number of nucleotides.

Discovery:

Coronaviruses were discovered in the 1960s; the earliest ones discovered were infectious bronchitis virus in chickens and two viruses from the nasal cavities of human patients with the common cold that were subsequently named **human coronavirus 229E** and human coronavirus OC43. Other members of this family have since been identified, including SARS-CoV in 2003, HCoV NL63 in 2004, HKU1 in 2005, MERS-CoV in 2012, and 2019-nCoV in 2019; most of these have been involved in serious respiratory tract infections.



Evolution:

The most recent common ancestor of the coronavirus has been placed at 8000 BCE. They may

be considerably
older than this.
Another
estimate
places the

Coronavirus

most recent common ancestor (MRCA) of all coronaviruses around 8100 BCE. The MRCA of Alphacoronavirus, Betacoronavirus, Gammacoronavirus, and Deltacoronavirus have been placed at about 2400 BCE, 3300 BCE, 2800 BCE, and 3000 BCE, respectively. It appears that bats and birds, the warm-blooded flying vertebrates, are ideal hosts for the **coronavirus** gene source (with bats for Alphacoronavirus and Betacoronavirus, and birds for Gammacoronavirus and Deltacoronavirus) to fuel coronavirus evolution and dissemination.

Bovine coronavirus and canine respiratory coronavirus diverged from a common ancestor in 1951. **Bovine coronavirus** and **human coronavirus OC43** diverged in 1899. Bovine coronavirus diverged from the equine coronavirus species at the end of the 18th century. Another estimate suggests that human coronavirus OC43 diverged from bovine coronavirus in 1890.

The MRCA of human coronavirus OC43 has been dated to the 1950s.

Middle East respiratory syndrome coronavirus, although related to several bat species, appears to have diverged from these several centuries ago. The human coronavirus NL63 and a bat coronavirus shared an MRCA 563–822 years ago.

The most closely related bat coronavirus and the SARS coronavirus diverged in 1986. A path of evolution of the SARS virus and a keen relationship with bats has been proposed. The authors suggest that the coronaviruses have been coevolved with bats for a long time and the ancestors of the SARS virus first infected the species of the genus Hipposideridae, subsequently spread to species of the Rhinolophidae and then to civets, and finally to humans. Alpaca coronavirus and human

coronavirus 229E diverged before 1960.

What are the *symptoms* of someone infected with a coronavirus?

It depends on the virus, but common signs include respiratory symptoms, fever, cough, shortness of breath, and breathing difficulties. In more severe cases, an infection can cause pneumonia, severe acute respiratory syndrome, kidney failure, and even death.

Can coronaviruses be transmitted from person to person?

Yes, some coronaviruses can be transmitted from person to person, usually after close contact with an infected patient, for example, in a household workplace, or health care center.

Is there a vaccine for a novel coronavirus?

When a disease is new, there is no vaccine until one is developed. It can take a number of years for a new vaccine to be developed

What can I do to protect myself?

Standard recommendations to reduce exposure to and transmission of a range of illnesses include maintaining basic hand and respiratory hygiene, and safe food practices and avoiding close contact, when possible, with anyone showing symptoms of respiratory illness such as coughing and sneezing.